HISTORICAL BUILDING
DES MOINES, IOWA

THE JOURNAL OF THE FLORIDA MEDICAL ASSOCIATION
PUBLISHED MONTHLY

Volume II | St. Augustine and Jacksonville, Florida, October, 1915 | Number 4

ORIGINAL ARTICLES

REFLECTIONS ON MODERN METHODS OF TREATMENT BY SERA AND VACCINES.*

W. S. THAYER, M. D., Hon. F. R. C. P. I., Baltimore, Md.

When your President so kindly asked me to speak before this Society it seemed to me that a suitable subject would be a series of reflections upon certain prevalent therapeutical methods, for after all there have, in the last twenty years, been great changes in our methods of the treatment of disease—changes which well deserve consideration more careful than is sometimes given them.

The past century has revolutionized the practice of medicine. As the speaker observed ten years ago at St. Louis,† medicine has changed in this time from a more or less speculative art to an art resting upon firm scientific foundations.

The great features of the last fifty years of medical progress have been first, the development of our knowledge of infections, and secondly, the advance in our comprehension of chemical and physical processes and their application to the study and treatment of disease.

The information which we have gained as to the cause of many infectious diseases and as to the manner in which the infection gains entrance, has given us the power to control largely many processes which but a few years ago were dreaded pestilences, especially fearful because of our ignorance as to their nature and source.

But during the greater part of the last century with all the advances made in our knowledge of disease, like progress had not been made in its treatment. By observation and empirical methods, much had been done to alleviate suffering, but it was yet true that the specifics remained but two—mercury and quinine.

A great advance toward new and specific methods of treatment was made in 1880 with Pasteur's§ classical observation that animals when treated systematically by doses of pathogenic bacteria of a virulence below that necessary to produce a fatal result, are rendered, on recovery, more resistant or truly immune to subsequent infections.

In 1884 Theobald Smith and Salmon‡ made the remarkable statement that immunity may be produced by introducing into the animal body the results of bacterial growth in culture fluids. In 1888-90 Roux and Yersin¶ showed that *Bacillus Diphtheriae* produced in its growth a soluble toxic substance of albuminous nature which, when introduced into animals, produced symptoms similar to those following inoculation with the organisms themselves, and in 1890-94 Behring, Kitasato, Roux and others demonstrated in the blood of animals to which sublethal doses of diphtheria toxine had been administered and of individuals con-

*Address in Medicine before the South Carolina Medical Association, Greenwood, S. C., April 21, 1915.

Originally published in the Journal of the South Carolina Medical Association and reproduced with the permission of the editor of that publication and the author of the article.

†The Problems of Internal Medicine, Science, N. Y., N. S., 1904, XX, 706-715.

§Bull. Acad. de Med., Par., 1880, 2s, IX, 121-134; ibid, 390-401; ibid, 527-531; ibid, 1119-1127.

‡Proc. Biol. Soc., Wash., 1884-6, III, 29-33.

¶Ann. de l'Inst. Pasteur, Par., 1888, II, 629-661; 1889, III, 273-288.

valescent from diphtheria an antitoxic substance which, injected into another animal, not only acted as a preventive but in the actual presence of the disease, by neutralizing the poison present in the circulation, brought about a rapid disappearance of the symptoms of the malady. Here at last, was a new and truly specific treatment discovered, not by accident, but by a series of carefully planned and accurately executed experiments. This was associated with the demonstration of the existence and value of anti-tetano-toxine.

Almost at the same time George Murray introduced a truly specific method of therapy of quite another sort in his demonstration of the efficacy of the treatment of hypothyroidism by the administration by the mouth of glycerine extracts of the thyroid gland. It is, however, especially upon the specific treatment of infections that I would dwell today.

Time unfortunately has shown that the number of pathogenic bacteria, the activity of which is due to soluble toxines produced by the growth of the organism, toxines to which a corresponding protective antitoxine is developed in the infected animal, an antitoxine which may be used as a specific remedy or preventive against the disease, is very small and practically restricted to the bacteria of diphtheria, tetanus and the unusual disease, botulism. With the greater number of pathogenic organisms the poison is, for the most part, closely bound up with the substance of the bacteria themselves and is set free especially on the occasion of the death and dissolution of the micro-organisms.

But it was discovered that on infection with these organisms whose poisonous effects are produced in a different manner, as well as on the injection of foreign proteid substances non-poisonous in themselves, the infected animal responds by the production of anti-bodies—cytolysins, agglutinins, opsonins, precipitins, whatever they may be called—substances the main object of which, as pointed out by Zinsser in his recent Harvey Lecture, seems to be the removal or destruction of the foreign substance inoculated. The presence of these specific bodies in the blood and the possibility of their demonstration by a variety of physical and biological procedures has led to a number of valuable methods of diagnosis, such as the agglutination tests, the precipitin test for human blood, the complement fixation tests for various infections, especially for syphilis.

The *prophylactic* introduction of sera of animals immune to infection of this class has unfortunately proved of little value, and from a *therapeutic* standpoint also, the results following the introduction of such immune sera have been disappointing.

However, in instances where the infection is localized, as in cerebro-spinal meningitis, it has been found possible largely to control the infection and to save a considerable portion of individuals who otherwise would fall prey to the disease by the use of concentrated sera containing the antibodies, introduced directly at the seat of infection. More than this Cole has recently shown that in pneumonia where the strain of pneumococcus causing the infection is determined accurately, the introduction of a large quantity of a specific anti-serum may exert a considerable curative effect.

It has, however, been determined that a considerable degree of *immunity* may be assured against a number of diseases, such as cholera, plague and especially typhoid fever by properly carried out *vaccination* with increasing doses of *dead* bacteria. These dead organisms set free a certain amount of poison and the animal body responds by the production of antibodies which, when after repeated injections, they have become sufficiently numerous, form a considerable protection against future infections so long as they remain present in the blood.

Yet another interesting attempt to in-

crease the resistance of the infected animal is represented by the practice of vaccinating the *already infected* individual with living or dead bacilli with the idea of further stimulating the production of antibodies. This method we may regard as having first been introduced by Koch in the treatment with old tuberculin. Old tuberculin, as is well known, consists essentially of an extract of the substance of tubercle bacilli, and the injection of this substance often produces remarkable local and general effects in the infected individual. It was early found, however, that large doses producing sharp reactions diminished rather than raised the resistance of the patient, and later the treatment by repeated introduction of very small quantities of tuberculin, too small to produce actual febrile reactions, has been practiced widely in different parts of the world. Although some have fancied that they have seen beneficial effects from this treatment, much, however, can not as yet be said.

The work of Wright and his studies on the opsonic index have, however, led to the widespread practice of vaccination with dead cultures of pathogenic micro-organisms in a large variety of diseases. Wright believed that he could show that, as the result of vaccination, the phagocytic power of the leucocytes could be increased greatly. The hypothetical substances which increase this phagocytic power he called "opsonins." He fancied that he could follow in the blood the variations in the phagocytic activity of the leucocytes in association with the rise and fall of these protective opsonins, and governed his treatment by control observations on the blood in the laboratory.

Studies of the methods of estimating the opsonic index in this country have not altogether upheld the assertions of Wright. His original methods were too crude to justify positive, definite conclusions, and indeed even with more careful procedure, most observers have felt that it is not easy to confirm his results. The practice of vaccination in many classes of infections, without control by regarding the opsonic index, is however widespread in many parts of the world, especially in England, and there is reason to believe that in some conditions good results are to be obtained.

In connection with our studies of infection and the mechanism of defense of the animal body, a phenomenon of great practical importance was brought to light by the observations of Richet, Theobald Smith and Arthus. As with so many great discoveries the observation was not new; but in the old days the significance of the phenomenon was not appreciated. Magendie* injected into the jugular vein of a dog a considerable amount of egg albumen in water without much ill effect. Later on attempting to repeat the experiment on the same dog by way of the cartoid, he was surprised to find that the dog died rapidly before he had introduced more than a drachm of the fluid. Portier and Richet in 1902,† noticed that the poison extracted from the tentacles of actinia killed rapidly and in much smaller doses when introduced into dogs which, two or three weeks before, had had a non-mortal dose. Arthus‡ observed that horse serum injected into rabbits in repeated doses at intervals of several days produced finally grave symptoms both local and general. Theobald Smith§ in 1903 made the extremely important observation that in guinea pigs to which diphtheria antitoxine had been administered without demonstrable symptoms, a second dose given a week or ten days later produced instant death. Since then it has been shown that most, if not all the foreign albuminous substances

*Lectures on the Blood, etc., English translation, 12.8°, Phila., Haswell, Burroughs & Haswell, 1839, 247 *et seq.*

†Compt. rend. Soc. de Biol., Par., 1902, LV, 170-172.

‡Compt. rend. Soc. de Biol., Par., 1903, LV, 817-820.

§Otto (R.), Gedenkschr. f. d. verbstorb. Generalstabsarzt d. Armee **** v. Leuthold, Berl., 1906, I, 153-172.

when injected into the animal body, give rise to a reaction in that organism characterized by the production of antibodies designed probably as has before been said, to destroy the foreign albumen. Now with poisonous bacteria these substances act promptly by killing the invading organisms. But the process of destruction of these invaders by the antibody is unfortunately not wholly devoid of significance. As von Pirquet has pointed out, the period in the course of an infection at which these antibodies first appear and meet with and attack the poisons is associated with phenomena, fever and other general symptoms, which form probably a part of that which we recognize as the symptoms of the specific disease. If at a latter period when the protective antibodies are already present in the animal's blood, poisonous bacteria gain entrance, they are immediately destroyed before they have multiplied sufficiently to form an actual quantity of foreign albumen sufficient to give rise through their destruction to any appreciable symptoms. This von Pirquet has illustrated most beautifully in the process of ordinary vaccination. There, as we all know, in the susceptible individual, a period of seven or eight days passes before anything is observed at the site of vaccination and then, suddenly, the characteristic local and sometimes general reaction begins. During this incubation period the pathogenic invaders have been increasing in number and the human organism has been preparing its protective antibodies. When these antibodies are set free in large numbers and attack and destroy the poisonous invaders the local and general reaction begins.

Suppose, however, we vaccinate an individual who has already in his circulation the protective substance. What do we notice? Within 24 hours after the vaccination the point upon the arm swells a little, begins to itch and looks as if it might be beginning to "take," but within a very short time this abortive "take" has passed by. What has happened? The probability is that here the already present antibodies have attacked immediately the poisonous organisms which have been introduced, and destroyed them before they have been able to multiply to any considerable extent. The result has been that the amount of poison set free by the meeting of the antigen, as the poisonous organism is called, and the antibody has been sufficient only to produce a minute local lesion and no general effects.

But with the introduction of a foreign albuminous substance the question becomes somewhat different. Such a substance may be relatively harmless in itself to the organism into which it is introduced. It may be non-poisonous as in the case of horse serum, for instance, in ordinary individuals. But this non-poisonous substance gives rise nevertheless to the development of antibodies, and when these antibodies have been produced, a week or ten days, let us say, after the first injection, the re-introduction of the foreign substance, if the quantity be sufficient, may result in the gravest of symptoms, even in the death of the animal. It would appear that these grave symptoms which develop on the second injection of a foreign proteid are directly associated, as in the case of bacteria, with the meeting of the antibody and the antigen and the setting free of some poison. The severity of the reaction varies with the quantity of the foreign substance introduced, and the reason that the reaction may be so slight or absent in the case of bacteria and so dreadful in the case of a foreign albumen is explained probably by the small quantities of the actual albumen present on the introduction of bacteria, and the relatively large amounts which are introduced when we inject directly a foreign albumen such as horse serum.

In other words, it appears that the animal body into which foreign bacteria or albumens are injected becomes "sensitized" to

these substances, that is, it contains antibodies. This hypersensitiveness to bacteria which results in the protection of the animal body we call immunity.

The hypersensitiveness toward non-poisonous foreign albumens, fundamentally similar to that which, in the case of bacteria, constitutes immunity, may be a grave danger to the animal organism; the phenomena by which it becomes manifest on the introduction of the antigen we speak of as *anaphylaxis* or better, in the words of von Pirquet, *allergy*.

I have gone into this matter at considerable length because it has seemed to me sometimes that in the use of these new methods of prevention and treatment of disease which have brought such immense benefit and even greater hope into our practice, we are sometimes forgetful that we are dealing with procedures which may give rise to dangerous manifestations, with substances which should be used with at least as great care as that which we exercise in the use of other mineral or organic compounds of the pharmacopoeia.*

Antitoxines.

Let us now consider certain specific methods of treatment, and first, naturally, the question of diphtheria. Now the diphtheria bacillus as we have said, produces in the process of its growth, a soluble toxic albuminous substance—the diphtheria toxine—and the animal into which this diphtheria toxine is introduced, provided the dose be not lethal, responds by the production of an antitoxine which neutralizes the poison and protects the individual. There has been no greater blessing conferred upon the human race in the lifetime of most of us here than this great discovery which has saved so many thousands of children. How may this antitoxine be prepared? How is it ordinarily produced? As is well known, the method of production of the antitoxine used in practice consists in the immunization of a horse by progressively increasing doses of toxine. When the highest degree of immunity is reached the horse is bled and the serum obtained and standardized in such a manner that the exact strength may be known. It is measured in units, a unit being that amount of antitoxine, 1 c.cm. of which will neutralize one hundred times the fatal dose of toxine for a guinea pig of 500 grammes. The mixture of such an antitoxine with a bouillon solution of toxine in proper quantities will in great part remove its toxicity. Furthermore, the injection of a sufficient quantity of antitoxine into the human being will render him immune for a certain period of time to infection with diphtheria bacilli. And more than this, unless the disease has progressed too far, the injection of a certain quantity of antitoxine will soon interrupt the course of an already acquired infection.

From a prophylactic standpoint various recommendations have been made as to the quantity of diphtheria antitoxine which should be given, but the careful studies of Schick have made it fairly clear that a dose of 50 units per kilogramme (2 and 1-5 pounds) of body weight is sufficient in almost all instances.

Now in the treatmeint of an actually existing diphtheria, the doses of antitoxine given have varied very greatly. Because of the neutralizing relations of toxine and antitoxine, the assumption has been made that enormous and repeated doses should be given in order to counteract any possible subsequent toxine production in the body, and huge doses have been administered, not only singly but repeatedly with intervals

*For the history and discussion of the subject of allergy and anaphylaxis the reader may consult the following articles: Anderson (J. F.) and Rosenau (M. J.)—Anaphylaxis—Arch. Int. Med., Chicago, 1909, III, 519-568, Pirquet (Cl. Fr. v.) Allergy, ibid, 1911, VII, 259-288; 383-440, Zinsser (H.) Harvey Lecture—To appear shortly in Arch. Int. Med. Auer (J.) The functional analysis of anaphylaxis. Forchheimer's Therapeusis of Internal Diseases, N. Y. and London, D. Appleton & Co., 1914, V, 39-112.

of several days, and often with apparently brilliant effect.

But the use of diphtheria antitoxine is unfortunately associated with certain distinct inconveniences and indeed with some danger, for after all one must remember that it is not only the antitoxine that one is administering, but antitoxine in solution in horse serum, a substance harmless in itself on the first dose in the immense majority of individuals, but yet capable of causing the formation of antibodies in the patient to whom it is administered, so that at a sufficient period later, reinjection finds the patient sensitized with the result that inconvenient or grave symptoms may follow. And this is sometimes observed in the administration of horse serum to patients. Ordinarily an injection of horse serum containing antitoxine produces no unpleasant immediate results, but not infrequently a week or ten days afterwards, there appears an annoying urticaria, sometimes patches of oedema, sometimes joint pains, together perhaps with a little fever. These symptoms are, however, usually transient and soon pass by. Let us, however, suppose that ten days or two weeks after this first injection of diphtheria antitoxine in horse serum a second dose is given. Almost immediately upon the introduction of this second dose symptoms follow which may be all the way from merely distressing and inconvenient manifestations to grave and even dangerous occurrences. The patient may have extensive oedema at the point of injection, a general urticaria, nausea, vomiting, rapid pulse, dyspnoea, perhaps grave asthmatic symptoms, syncope and even death. In the adult where the quantities of horse serum introduced are relatively small compared to the size of the individual, the symptoms are usually more inconvenient than dangerous; nevertheless there are grounds for caution.

What has happened? In the first instance, what is commonly called serum disease has occurred. The introduction of the foreign serum has produced the reaction in the body to which we have above referred —the production of specific antibodies to the horse serum; but these arise so slowly that at the time when they are set free the amount of foreign serum in the blood is slight; indeed, it may be entirely absent. If it be present in slight quantities the result of the meeting of antigen and antibody is evident usually in mild, transient symptoms such as those to which we have referred. But if a large dose of foreign serum be introduced into an animal or human being a week or ten days after a previous injection of the same serum, i. e., into an organism already sensitized and containing a considerable quantity of specific antibodies, then the meeting of antibody and large quantities of antigen may set free a large amount of poison and grave manifestations of anaphylaxis or allergy occur.

Now if one remembers the observation of Arthus to which I referred to before, namely: the frequent occurrence of oedema and grave symptoms in guinea pigs on *repeated* injection with a foreign serum after some days of intermission, one can readily see that this is exactly what one might expect in human beings. We might well ask ourselves whether, with the repetition of doses of diphtheria antitoxine after a few days of intermission, similar unpleasant symptoms might not occasionally occur; and it is true that they sometimes do.

Fortunately, however, the researches of Schick* and others have shown clearly that these repeated doses are unnecessary. The chief value of antitoxine is in its immunizing effects. It has some neutralizing influence on a toxine introduced from three to six hours before, but only a little. The great effect is upon toxines introduced at the same time or developing later, and careful studies have shown that while very large doses, perhaps as large as 500 units

*Schick (B.), Kassowitz (K.), and Busacchi (P.): Ztschr. f. d. ges. exper. Med., 1914, IV, 83-148.

per kilogramme of body weight, may have a maximal effect if there be a large quantity of toxine present at the time of introduction, yet in all ordinary cases 100 units of antitoxine per kilogramme of body weight gives the maximal effect. And furthermore, *and this is very important*, it is never necessary to repeat the dose—a single dose is sufficient.

In a given case of diphtheria then, the antitoxine should be given so soon as possible, and the proper dose is 100 units to the kilogramme of body weight in ordinary cases. It should be given by deep intramuscular injection. In the most severe cases 500 units per kilogramme may be administered. That is, in a child of twenty kilogrammes (44 pounds) 2,000 units will be enough in 90 per cent of the cases. In very severe instances, however, 10,000 units may be given. In an adult weighing 60 kilogrammes (132 pounds) 6,000 units is usually sufficient, but in very severe cases 30,000 units may be given. It is never necessary to repeat the dose. In the words of Schick, "repeated doses should be abandoned as wholly superfluous."

But when this has been said, we have still to bear in mind an extremely important circumstance, and that is this—a certain small proportion of individuals possess as a natural peculiarity an extraordinary hyper-susceptibility toward horse serum, while others have become hyper-susceptible as the result either of a previous injection of diphtheria antitoxine or of horse serum for some other purpose. In such individuals the introduction of any appreciable quantity of horse serum may produce symptoms of the utmost gravity. These symptoms may be rapid, almost immediate, varying from vertigo, dyspnoea, tachycardia, syncope, cessation of respiration and death, to the lesser symptoms of oedema, urticaria, nausea and other symptoms of serum sickness. The severe and dangerous manifestations of hypersusceptibility are very rare, and yet they do occasionally occur. Those individuals who are naturally hypersusceptible are commonly sufferers from asthma, hay fever, rose colds or subjects of urticaria or angoneurotic oedema. One should always inquire into the history as to these conditions before administering antitoxine, and, in an asthmatic subject, every precaution should be taken.

To make the point clearer let me mention a few specific instances. Seventeen years ago while treating some cases of diphtheria I took a preventive inoculation of about 1,000 units of diphtheria antitoxine in perhaps .5 c.c. of horse serum. About six months later another child with diphtheria coughed into my eye. Again I took a prophylactic dose. Almost immediately, at the seat of inoculation, a violent urticaria began. This spread over my entire body and was associated with nausea, headache and considerable prostration, which lasted for two days—a good example of the ordinary manifestations of allergy in an adult as the result of a previous injection of serum.

A child, I think under five years of age, the daughter of an old friend of mine, an assistant in the pathological laboratory in Berlin, was given in the early days of the treatment, an injection of diphtheria antitoxine and died instantly upon its administration.

Diphtheria developing in a family, the Health Warden of the district gave preventive doses of antitoxine to all members of the household without consulting the family physician. One of the children died instantly upon receiving the injection.

A year or two ago diphtheria appeared in a well known boys' school in the north. A general preventive inoculation was carried out. One of the boys came in from the football field, was given his injection, started back toward the field, suddenly felt dizzy and faint, had a peculiar suffocating sensation and in a few minutes was dead.

Such instances as these latter are among

the most awful experiences of medical practice, and such possibilities, rare though the event may be, are quite enough to make one hesitate to use such a method of treatment.

Can we avoid such manifestations? If so, how?

Happily it is perfectly possible to avoid them, and no one, in the present state of our knowledge, is justified in giving a prophylactic dose of antitoxine without taking certain definite precautionary steps. In the first place the studies of Schick of Vienna* have given us a most interesting and valuable method of testing the susceptibility of an individual to diphtheria infection. It is well known that many individuals may be exposed to diphtheria without acquiring it, and Schick has given us a method of detecting these individuals who are truly insusceptible to the disease. It has been shown that the introduction of a small quantity of diphtheria toxine into the skin produces within 24 hours a local reaction similar to that occurring in a positive tuberculin test, and dependent upon the irritating qualities of the toxic substances introduced. Such a reaction occurs only in those subject to the disease, i. e., individuals who do not possess antitoxine in their circulation. These interesting observations have been confirmed by Park, Zingher and Serota,† by Kolmer and Moshage‡ and by others. Those who fail to show this reaction to diphtheria toxine (Schick's test) are immune, insusceptible to diphtheria and need no prophylactic treatment.

Studies of the susceptibility of individuals of different ages carried out by Park, Kolmer and Schick show, if we combine their statistics, the following interesting figures:

Percentage of susceptible individuals. Positive Reactions

Age	
Under one year	13 per cent
1-5	57.8 per cent
5-10	50.1 per cent
10-15	33.3 per cent
Over 15	26 per cent

Incidence of diphtheria according to age. 14,000 cases (Kolmer).

Age	
Under one year	3.2 per cent
1-5	45.4 per cent
5-10	32.2 per cent
10-15	8.1 per cent
Over 15	11.4 per cent

This shows that in at least fifty per cent of individuals preventive inoculations are wholly unnecessary.

The method of performing the test is simple. The amount of toxine to be introduced should be from one-fortieth to one-fiftieth of the minimal dose of diphtheria toxine lethal for a guinea pig in four days, so diluted (Schick and Park) as to be contained in from .1 to .2 of a cubic centimetre. The toxine unfortunately deteriorates very rapidly and must be made fresh, so that the test is possible only where one is in touch with a reliable laboratory. But if as seems certain, the value of the test is upheld, health departments local and central, will have to make arrangements to supply the necessary substance.

Kolmer's directions for making the test are as follows:

"The injection is made intracutaneously by pinching up a fold of skin between the index finger and thumb and inserting the needle into the epidermis. As the injection is made a whitish spot develops and a slight stinging pain is felt; if this raised anaemic area is not seen the injection is probably too deep and unsatisfactory.

A very fine needle (No. 26) and a perfectly adjusted syringe are necessary. We have used with much satisfaction the Ricord and Fournier's tuberculin syringes. Platinum iridium needles are especially useful, as they are readily sterilized in a flame and are thus adapted for giving a large series of injections.

Injections are readily given in the skin of the arm near the insertion of the deltoid muscle after cleansing with alcohol and drying the skin.

*Muenchen. Med. Wchnschr., 1913, LX, 2608-2610.

†J. Am. M. Ass., Chicago, 1914, LXIII, 859.

‡Am. J. Dis. Child, Chicago, 1915, IX, 190-204.

The reaction. This appears in from twenty-four to forty-eight hours after injection and is characterized by an area of erythema with a brownish tinge measuring from 0.5 to 2 cm. in diameter and accompanied by slight oedematous infiltration of the underlying tissues. In colored persons the erythema can usually be seen, although not always sufficiently well to measure, but the oedema is readily palpable. The reaction usually reaches its height in from forty-eight to seventy-two hours and then begins to fade within a week or ten days, accompanied by some itchiness and usually followed by a brownish pigmented area of some days' or weeks' duration. A slight superficial scaling, due to the necrosing effect of the toxin on the superficial epithelial cells is generally noticed. In the majority of instances there is no general reaction."

Kolmer gives a dose less diluted than do Schick and Park, using one-fortieth the minimal lethal dose of toxin so diluted with sterile salt solution containing 0.25 per cent phenol that is contained in 0.05 c.c. He feels that with the smaller amount of fluid less trauma is produced and less doubt exists with regard to the reaction. The full details may be found in Kolmer's excellent article in the March number of the American Journal of Diseases of Children.

The test may be made by means of von Pirquet's scarifier, but Kolmer prefers the intracutaneous method.

In such a manner then, we may gain rapid information as to the susceptibility to diphtheria of any given individual. In a large proportion of individuals prophylactic treatment is, thus, unnecessary.

But suppose prophylactic treatment seems desirable, what steps should we take to avoid a possible allergic reaction?

One should always make a preliminary injection of one to three drops of antitoxine and wait from one-half to two hours to observe its effect. If there be no appreciable result one may safely administer the desired dose. If, on the other hand, there be a sharp reaction of urticaria or oedema, or if, as rarely occurs, there be general symptoms, one must take other steps. If there be merely urticaria and oedema at the seat of injection, after one-half to two hours or less one may give a second dose of one c.c. and then, after a second period of two hours, the full dose may safely be given, for it has been shown that a desensitization may be rapidly carried out.

If graver symptoms, such as vertigo, have occurred, it may be safe to give after the first dose, several gradually increasing injections at one or two hour intervals before giving the sufficient dose.

If, however, grave symptoms occur on the first introduction of a drop or two, vertigo, fainting, dyspnoea, nausea, tachycardia, oppression, asthma-like manifestations, one may consider the advisability of omitting further attempts at prophylaxis. But if the exposure has been serious it will probably be safer to continue with increasing doses as has just been advised. One may adopt, as the first step, the procedure advised by Besredka of giving 50 c.c. of antitoxine by rectum.

Suppose, however, that we are in the presence of a fairly developed case of diphtheria. Should we hesitate to give a full dose immediately? We should, I think, always try a preliminary injection of a few drops of antitoxine and wait one-half to one hour. The length of time for desensitization in such cases is not very great, and the risk is too large.

A most interesting example came to my attention but a few days ago. My friend, Dr. Thomas F. Branson, of Rosemont, Pennsylvania, was called to a neighboring college to see a student with diphtheria. As soon as the diagnosis was established, to use his own words, "Steps were taken to give the specific treatment. As has been my habit for many years, after the introduction of the needle, about 2 to 4 minims of

the antitoxine were injected. I then waited for twenty minutes to note untoward effects. In the present instance after about five minutes there was a sudden blanching of the face, pupils were much dilated, lips white, pulse which had been about 90, rose to 120 and was thready, respirations were slow, shallow and sighing. The patient's complaint was, 'I cannot breathe.' Conscicusness was not lost. * * * In about half an hour all symptoms had passed. A few hours later the patient was seen with Dr. McCrae in consultation, and it was determined to give a few minims as a second dose, in the belief that the factor of danger in this case would have been overcome by the earlier administration. About 12 c.c. of serum containing 3,000 units of antitoxin were given at this time, the administration consuming a period of about one and a half hours. No physical signs were present during the second injection. Subsequently about 9,000 units were given or in all a bulk of perhaps 50 c.c. of serum. At none of the subsequent injections was there any systemic reaction." It is highly probable that in this instance the patient's life was saved by the prudence of her judicious attendant.

If by chance we should meet with a patient who shows a high degree of hypersensitiveness to a very small amount of horse serum, one may hesitate in attempting further treatment. But just such an experience as this would justify one to making the attempt if the case were truly urgent. In such cases we should proceed with gradually increasing doses at half hour intervals till the full dose be given. Or if it seem wise, one may at first try a rectal injection of 50 c.c.

If, then, we bear this possible danger in mind, and if we remember that 50 units per kilogramme of body weight is a sufficient prophylactic dose, and that 100 units per kilogramme of body weight is a sufficient therapeutic dose in all ordinary cases of diphtheria, except in very grave instances where 500 units per kilogramme may be given, and lastly, if we remember that a *single dose is quite sufficient and that additional doses are not only unnecessary but unwarranted*, we shall be in position to obtain the greatest possible benefit from this most valuable and truly specific method of treatment.

A consideration of the phenomena which occasionally occur as a result of the administration of diphtheria antitoxine should impress upon us very strongly the truth that the introduction of a foreign serum into the human organism is by no means a simple procedure or one that is to be entered into carelessly.

The one other malady for which we possess a true spicific antitoxine is tetanus, but unfortunately the treatment is rarely efficacious after the symptoms have appeared for the reason that the poison has passed rapidly upward through the nerves into the central nervous system and has attacked the ganglion cells of the nervous centres. At this period, injection of antitoxine has little effect. Von Behring* advises a prophylactic subcutaneous dose and, if the wound continues angry, a local injection at the seat of infection.

Von Behring further advises, if the disease has already broken out, a local injection at the point of infection as well as an injection intravenously. He also advises the introduction of antitoxine into the nerve trunk leading from the region of the wound. But this is not easy to do and recent observers have reported remarkably good results from the early introduction of antitoxine by lumbar puncture. In this manner the antitoxine not only rapidly reaches the nerve centres but also enters the general circulation, while when introduced into the general circulation, it does not reach the nerve centres in any appreciable quantity.

*Deutsche Med. Wchnschr., 1914, XL, 1956.

Park† advises as an immunizing dose the immediate injection of 1,000 units of antitoxine and it may be well to follow Von Behring's advice and to give a little more at the site of the wound.

In the treatment of an actual case of tetanus Park advises the intraspinous injection of 500 to 2,000 units in a child according to its size and 3,000 units in an adult. The amount of fluid should be as large as may be injected without producing pressure symptoms—5 to 20 c.c. In addition to the intraspinous injection, Park advises intravenous treatment, the dose amounting to 2,000 units for ten pounds of body weight. These two injections, he says, practically suffice for the antitoxine treatment, as the blood will remain strongly antitoxic for five days. It goes without saying that before giving a preventive dose of tetanus antitoxine the same precautions should be taken which are taken with administering horse serum with diphtheria antitoxine. It is fair to say, however, that if we meet with an instance of already established tetanus there is no time to spare and most of us would prefer to take the risk in making our injection immediately.

Antisera.

Now let us consider for a minute what we may do to combat infections with those organisms, the deleterious effect of which is not due primarily to soluble toxines. Here, as has been said, the infection is normally brought to an end by the development of antibodies—precipitins, agglutinins, bacteriolysins, opsonins—whatever they be called, which tend to favor the destruction of the infecting organism. Unfortunately, it is apparently true that in order to produce any effect sufficient to be of great value, the antisera have to be introduced in quantities so large as to make effective treatment very difficult or impossible.

Few results worthy of serious consideration have been obtained in severe general infections. In cerebro-spinal meningitis, however, where the infection is localized, we have a most valuable method of treatment, which consists in the repeated introduction of the antiserum directly into the cerebro-spinal canal—the seat of infection. The antibodies are thus able to reach the seat of infection in a degree of concentration sufficient in a considerable proportion of cases, to bring about a satisfactory result.

Moreover, in bacterial dysentery results of some value have been obtained by early, large and repeated doses of antiserum, especially in small children. The use of antisera in most other general infections has, however, proved disappointing. In cholera, in plague, in typhoid fever little has been accomplished. Attempts have been made to produce antistreptococcus sera, but without satisfactory results. One reason possibly is the circumstance that there are so many varieties of streptococci which, with our present methods, it is impossible to recognize and distinguish.

Polyvalent sera have had little better results; and I am unaware of any thoroughly satisfactory evidence of the essential value of any of these antisera. Nevertheless, it is conceivable that in streptococcus infections if it were possible to identify just the strain of organism and to introduce a sufficient quantity of an immune serum, some help might be obtained.

In pneumonia, thanks to the researches of Cole, Dochez and others‡, some progress seems to have been made. As you know, Cole has distinguished four main types of pneumococci which may be distinguished by laboratory methods. In two of these forms special antisera have produced apparently an appreciable result, but here at

†Forchheimer's Therapeusis of Internal Diseases, N. Y. and London, Appleton, 8°, 1914, V, 469 *et seq.*

‡Dochez (A.R.) and Cole (R.I.) Pneumococcus Infection: Forchheimer's Therapeusis of Internal Disease, 8°, New York and London, D. Appleton & Co., 1914, V, 472-508.

present the doses of serum have to be very large. The effort is now being made to find some methods by which this and other difficulties may be obviated.

In all these maladies again, wherever the question of the introduction of a foreign serum arises, the same precautions should be taken. Where there is a serious question as to whether the introduction of the serum is going to be of any value, we should be much more careful about taking risks. We should always remember the possibility, slight though it may be, that one may meet with an hypersensitive patient. One should never administer a large dose of such serum to an individual with a history of asthma; one should always ask whether there has been previous hypodermic treatment with horse serum, and if this is the case, one should proceed carefully with minute and increasing doses at short intervals.

Vaccines.

Prophylaxis. But it is not only by the production of a passive immunity through specific antitoxines and antisera that we may seek to combat disease. The oldest prophylactic methods have been attempts to produce active immunity by means of the production of the disease itself under favorable conditions, as in the old inoculation for smallpox, or by vaccines with attenuated cultures such as is practically the case in cowpox or in the vaccination introduced by Pasteur in chicken cholera and in anthrax. In more recent times, following the observations of Pfeiffer, attempts have been made to produce an active immunity in a variety of diseases by the introduction of dead cultures of the specific organism in increasing doses. Thanks especially to Wright, the value of such vaccination against typhoid fever has been shown to be very great, the results in the United States Army having been especially creditable and striking. The same is true to some extent in various other diseases; vaccination with dead cultures gives a certain degree of immunity against cholera and plague and dysentery, and it is not impossible that improved technique may offer material protection against many of the more dangerous epidemic fevers.

In most of these conditions there is no material danger in the procedure of vaccination provided the quantity of organisms introduced is not too great, and provided the vaccine has been properly prepared. At the present moment the gravest danger would appear to lie in the rare but occasional contamination of smallpox vaccine with tetanus, and the possibility that the vaccine may be, as we have indeed observed recently in connection with a certain typhoid vaccine put forth by a reputable firm, quite inert.

Vaccine Treatment.

But another question has arisen in recent years which is of considerable importance in the practice of medicine today, and that is the question of the possibility of the use of vaccines in the treatment of existing diseases. The principle on which vaccination in the treatment of infectious diseases has been introduced is that of stimulating the organism to produce protective anti-substances quicker and more thoroughly than it has been doing, and thus to hasten the end of the infection. This is accomplished by introducing an additional dose of the poisonous organisms already present, in such condition, however, that they are incapable of further propagation. Such treatment would seem to be especially reasonable in localized infections of moderate extent, or in infections from which perhaps the bacteria enter into the blood only at intervals. Here an extra impulse to the formation of antibodies given by vaccination, might reasonably be expected to give additional powers of resistance to the organism. But if the process be a severe general infection where the fight between the invader and the host is still undecided, one may well ask the question whether the introduction

of an additional quantity of the poisonous antigen (in such cases the infecting bacteria) may not be a rash or dangerous procedure; for why should we not, in this manner, add strength to the already threatening intoxication; why might not our very interference be that which finally decides the day in favor of the infectious agent? How can we tell that our small contribution may not be just the reinforcement which is necessary to give the battle to the enemy?

These are the thoughts which naturally come to the mind of the serious man who considers the question of vaccination as a therapeutic procedure. All of us who lived through the excitement associated with the production of tuberculin cannot fail to have seen the harm which may be done by a procedure which is practically a vaccination; and if the possible danger of diminishing rather than increasing the resistance of the patient, that which according to Wright actually occurs during a brief period following vaccination, should be seriously considered. But with or without control by study of the opsonic index, vaccination with dead cultures of the infecting micro-organism has given apparently encouraging results in a variety of different conditions.

The most satisfactory results, I should say, have been in the treatment of local infections with staphylococci, especially in acne, furunculosis and rosacea. Here good influences are often obtained by the use of vaccines prepared from cultures made from the seat of infection, that is so-called autogenous vaccines.

A good deal has been written with regard to the treatment of complications of gonorrhœa by autogenous vaccines, but outside of infections with staphylococci there are grave differences of opinion as to the value of the results which have been obtained.

Tuberculin, of course, has been widely used, and there are observers who feel that some increase in the resistance of the patient may be induced by the very careful administration of gradually increasing doses. All observers who have studied this matter deeply are in agreement, however, that such treatment demands very careful oversight by a trained observer.

Vaccination has been practiced in many different conditions. Some observers have thought that they have had good results in the treatment of local colon infections, cholecystitis, pyelitis, cystitis; others feel that some results have been obtained in the treatment of chronic bronchitis. In some instances the vaccination of typhoid carriers has apparently been successful. Few have had reliable results from vaccination with pneumococci or streptococci, although there are those who have fancied that they have seen improvement in some instances of arthritis supposed to be dependent upon local foci of streptococcus, especially *s. viridans* infection.

Exactly what we may hope to obtain from vaccination as a therapeutic measure has been admirably expressed by the greatest authority on this subject in America. Theobald Smith* says: "All parasites tend to increase the resistance of the host in which they live and multiply. Out of this universal fact a number of practical problems arise. In any given disease is it worth while to try to raise this immunity, and how much energy will it cost the patient? If worth while, what is the best and most sparing way of raising such immunity artificially? In any localized infection we must ask: Is this a beginning process without attendant immunity, or is it a residual process associated with general immunity? If the latter, vaccines may be considered safe. In processes associated with fever and bacteriemia, science says: Hands off! until we know whether we have a progressive disease with gradual undermining of the resistance or a more localized affection in which the excur-

*An attempt to interpret the present day uses of vaccines. J. Am. M. Ass. Chicago, 1913, LX, 1591-1599.

sions into the blood are secondary. In any case the use of vaccines in these cases must be regarded as experimental, and should not be undertaken save by one trained in immunologic problems.

Judged from this point of view, as well as from the work of the laboratory as a whole, we should say that vaccines applied during disease will be rarely, if ever, life saving, but they may hurry a stationary or languid process which tends towards recovery, by bringing into play the unused reserves of various tissues."

It is easy to see from this that vaccination may be associated with real danger, and alas, I have seen clinical evidence of its ill effects more than once. It is of vital importance for us to remember that in introducing into the human being cultures of poisonous micro-organisms we are playing with dangerous arms; that our first duty is to avoid doing harm. We should remember that the very first step in the treatment of a given case by therapeutical vaccination should be the careful bacteriological study of that case, and a thorough understanding of the nature of the infection; that it is useless and worse than useless to vaccinate an individual with an organism which is not that causing his disease; that only under rare and occasional circumstances is it justifiable to vaccinate with any but an autogenous vaccine.

Within a few years, however, certain manufacturing houses have placed upon the market a number of bacterial vaccines which they rashly recommend as efficacious against a number of diseases, and notably against various forms of arthritis.

Now what conditions could justify us in using a vaccine in the treatment of a case of arthritis?

First, we should be assured that the vaccine is made from the micro-organism which is causing the disease; secondly, we should be assured that the use of the vaccine will not be harmful, and thirdly, we should have at least a reasonable assurance that there is a likelihood that its use will be beneficial.

But the determination of the exact bacteriological cause of a given instance of arthritis is usually an extremely difficult matter, involving long and complicated bacteriological studies which can be carried out only in association with a good laboratory and a trained student, and even then it is usually only a matter of inference. Suppose, however, we have good reason to believe as a result of cultures from the blood or from the affected joints or existing local foci, that the arthritis is due to some form of streptococcus or pneumococcus infection; should we then be justified in using a stock vaccine? Under no circumstances, for we have no proof whatever that the organism is of the same strain as that from which the stock culture is made.

But suppose we have, after all, produced an autogenous vaccine, are we then safe in using this? Is there any danger of doing harm in the treatment of such a patient? The danger of doing harm may be little in some instances of chronic afebrile arthritis, but when we come to an acute arthritis with fever we must bear in mind that some of these conditions are also associated with a septicaemia and a complicating endocarditis in which the balance between attack and defense may be very delicate, and in which the introduction of an autogenous vaccine unless it be very carefully administered, may result in diminishing rather than increasing the resistance of the individual. I remember two cases of slow, chronic vegetative endocarditis due to *streptococcus viridans*, one of them with arthritis, in which the clinical course clearly indicated that the sharp reactions following a vaccination had been the definite turning point of the malady towards its fatal issue. One can at the most say that vaccination in arthritis is in an experimental stage, and, although, in some instances, we may yet desire to make the experiment, it should be undertaken only on consultation with, and under the direction of one skilled

and experienced in these methods of treatment. The use of stock vaccines in the present state of our knowledge in any form of arthritis is a rash, dangerous and unwarrantable procedure, unscientific and unjustified from a standpoint of clinical experience, despite the assertions of the manufacturing pharmacists. The physician who allows himself to be led by the advertisements of manufacturing pharmacists is not a safe practitioner of medicine.

I speak of these anti-rheumatic vaccines only as an example. The same considerations apply to the employment of most stock vaccines with the single exception perhaps of staphylococcus vaccines as employed in acne and furunculosis, where in the absence of the *possibility* of obtaining an autogenous vaccine, one would not perhaps condemn wholly their careful trial.

Let us not forget that therapeutical vaccination is still in an experimental stage. As Professor Pearce* well puts it: "Prophylactic vaccination rests on a sound scientific basis of experimental study and clinical observation. * * * Curative vaccination has no sound experimental basis, but the application of the general principles of immunity as well as clinical observation offers a plausible basis for the treatment of localized, more or less chronic infections, and of 'carriers.' On the other hand, no satisfactory basis is at hand for curative vaccination in the acute, self-limited diseases characterized by general dissemination and systemic infection. All attempted vaccinations in this group must be considered as purely experimental."

Therapeutic vaccination is then a method of treatment into which the physician is not, as a rule, justified in entering without expert advice, and this has been well said by Wright,† himself, who observes that vaccine therapy demands "a man who has spent years of study to master the technique, to know how to make the vaccines, to know where to look for the microbe, to know which are the most important microbes, to know how to isolate them, and most of all, a man with sufficient experience and ability to apply all these things."

But I have allowed myself to ramble too far already in these therapeutical reflections. What I have desired to do is to point out the great steps forward that we have been making toward a true, specific therapy of many diseases; but I have also wished to emphasize the truth that these methods of treatment are for the most part delicate, and must be applied thoughtfully, carefully and with full realization that there are dangers, rare though they may be, involved in their use, just as there are dangers in the use of any drug; and I have wished especially to insist that certain other methods of treatment, especially the therapeutic use of vaccines—methods still in an experimental stage, and in many instances unquestionably of an extremely delicate nature, have unfortunately become prematurely popularized and are being practiced today in an unscientific and dangerous manner—in just such manner as tuberculin was used twenty odd years ago. While the practice of prophylactic vaccination has, in some instances, become a safe, useful and well established procedure, vaccination as a therapeutical measure is still, with a few exceptions, in an experimental stage, and is justified only under the direction and with the advice of a skilled bacteriologist and serologist; vaccination is not as a rule a method of treatment which the unaided clinician is justified in employing.

Let us not mar the really great scientific progress of the last thirty years—progress which has given us so much and from which we may expect so much more—let us not mar these great gains and endanger further advance by rash, hasty and unscientific practical generalizations.

*J. Am. M. Ass., Chicago, 1913, LXI, 2115-2119.
†Quoted from Pearce, op. cit.

A COMPOSITE BOARD OF MEDICAL EXAMINERS.

R. H. McGinnis, M. D.,
Jacksonville, Fla.

For the past month or more I have examined the Medical Practice Acts of nearly all of the states in the Union; those who have separate Boards of Examiners, as Florida has, and those who operate under a composite board. I am fairly well convinced that we, the oldest and most scientific profession engaged in the treatment of the sick and the prevention of disease, would make a mistake to amalgamate with the so-called drugless practitioners. The history of medicine reveals many pseudo-quasi-scientific off shoots in the past which have had their day and disappeared, and, at the present time more and more cults and pathies are attempting to engage the public attention. If we associate now with one, how many years will elapse before we will have to consider the others?

The regular medical profession demands facts to sustain contention. Theories have to be proved beyond doubt to meet approval. Postulates are enunciated on proven conditions and every new finding must conform to established laws. With the drugless practitioner (and I would always designate him or her as a practitioner and not a doctor) we have very little in common. They may study the fundamentals of medicine, chemistry, anatomy, physiology, pathology, etc., but they interpret their knowledge of these branches very differently from us. "Osteopathy, as is generally known, originated in the dreams of a country doctor in Missouri about a quarter of a century ago. It is based according to its founder and prophet on the following propositions: The human body is a machine; disease is due to the dislocation of some structure in the body; the treatment of any abnormal condition is to find the dislocated structure and restore it to its proper position."

Pathology is certainly as exact as any science, deviation so little from irrefutable laws and infallible conditions, when interpreted by reliable authority, that it may be ignored as one of degree and not of kind. On pathology, the medical profession bases its therapeutics. A patient with a valvular lesion, a decompensating heart, the usual train of symptoms, dyspnœa, anasarca, engorged liver, spleen and abdominal organs, etc., is not considered as suffering from pressure on a spinal nerve or dislocation of some structure. Diphtheria, a well-known bacterial disease, a safe and sure therapeutic agent for its cure at hand and easy of administration, is treated by drugless practitioners as if some nerve needs relief from pressure, or, by prayer. Can the regular profession afford to offer its assistance to foster such pathology? To attempt to associate and co-operate with the drugless practitioner would lower the standards the medical profession has set up for itself, and endeavoring to maintain, and be a failure; as far as bringing them to an understanding of its principles and the knowledge it has gained through centuries of painstaking and persistent study. Is it not better to continue to advance the standards of the regular profession and devote our energies toward the education of the public? A slow process—admitted—but the only sure and lasting one.

I admit that the ideal regulation of medical practice would be through the operation of a composite board. I quote, "The responsibility for licensing of medical practitioners has been left by the national government to the individual states; it is left to the state to establish the only legal barrier possible between the public and the thousands who seek the authority to treat human diseases. Some states have provided efficient guaranty that practitioners given the state's endorsement have secured the essential educational qualifications. In some states, however, the responsibility has been taken up in such a happy-go-lucky manner and the legislation provided is so contrary to effective legal

procedure that the situation would be laughable, were it not the serious menace to the public. In some states laws have been passed admirable in their composition and excellent in their purpose, only to be invalidated by clauses or by other laws exempting the very persons to whom the law should apply. Invariably, the exemptions are of those unable to comply with the educational requirements of the Practice Act and against whom the people most need protection—those who have little or no medical training. * * * Legislators have yet to learn that the art of healing is not gained by birth or inspiration, but by a rigid and prolonged course of training in the fundamentals of medicine." I believe more substantial results will be accomplished by education than by legislation.

The schools and colleges of regular medicine are becoming more and more strict in admittance requirements and the student desiring a medical education in the future must have many years of preliminary preparation. Many colleges and universities of medicine are amalgamating to facilitate thorough clinical teaching. Men of recognized ability are being employed as whole-time professors so that their entire time and talents are at the command of the student. With this advanced standardization of teaching institutions, there must follow a better equipped and more thorough physician. The standards of state boards of medical examiners (as long as there are such) ought to follow rapidly those of the schools.

The homeopathic and eclectic colleges are gradually becoming less and less in number and the student body in these institutions are materially reduced in recent years. The young man or woman of today wishing or electing to study medicine will consider very seriously the nature and standard of the school from which he or she is to receive a diploma. The regular, the homeopathic and the eclectic physicians of Florida, drug physicians, might centralize their efforts in securing a composite board of examiners. Graduates from the three schools are taught practically along the same lines, especially as concerns the fundamental branches of medicine. Their difference of practice consists essentially in the administration of drugs—quantity and kind.

If a uniform measure can be drafted and united effort made, the physician of the state may operate under one law. The drugless practitioners may have their own laws regulating their examinations and practice. If it is possible and not feasible for the regular, homeopathic and eclectic to amicably adjust differences, the regular profession should continue their efforts to elevate their own standards, raise their ranks to the highest efficiency and educate the public to a higher sense of appreciation of their services toward the betterment of conditions and alleviation of human ills.

Previous efforts of the regular profession in procuring medical legislation has always emanated from an altruistic motive and tended toward a better service for the public. Medical legislation, as advocated by the profession, has added responsibilities to the profession and advanced the standards of higher medical education. The insufficiently educated medical man has had to prolong his studies and the immoral have had to become moral or give up practice where the laws are adequate. The medical man, more than any other, knows the inefficiency of his colleagues and he knows the sufferings of the public that follow inefficiency. He is in possession of the knowledge that will remedy the matter provided he can secure the attention of the legislator, and it behooves every true physician to exercise the privilege afforded him in his daily contact with men to acquaint them with his views and in no uncertain terms. With the profession working as a unit, zealously and earnestly, the measures in the interest of the public, which it advocates, will eventually prevail.

A PLEA FOR BETTER HEALTH ORGANIZATIONS IN THE SMALLER MUNICIPALITIES OF FLORIDA.

M. E. Heck, M. D.,
Assistant to the State Health Officer,
St. Augustine, Fla.

As we cast our eyes over the history of Florida during the past quarter century, the forward strides of this great commonwealth appear nothing short of marvelous. Cities have sprung up where villages existed, swamp lands have been reclaimed, groves and farms have been developed, and railroads have been built. In all this period the Florida State Board of Health has stood as a beacon light pointing the way to better health and the prevention of disease, thus helping to make this great development possible. Education and not compulsion has ever been the policy in the fight against preventable diseases. In this way, step by step, the work of the Board has been enlarged until at the present time several well equipped bacteriological laboratories are conveniently located for the accommodation of physicians of the state; a public health exhibit is now going the rounds of the cities of Florida and literature on all public health subjects is distributed free to all who request it. Besides all this the state is divided into six sanitary districts, each of which is in charge of an Assistant to the State Health Officer. His duties consist of making investigations and inspections from time to time, helping in educational work, taking charge of outbreaks of communicable diseases, and co-operating with authorities in the various cities in his district in such manner as may from time to time be required.

It is as one of the Assistants to the State Health Officer that I have been employed for the past two years. During this time I have been assigned to the East Coast Sanitary District, comprising the counties of Duval, Clay, Putnam, St. Johns, Volusia, Brevard, St. Lucie and Palm Beach. In this long stretch of territory are nearly forty incorporated cities and towns, not to mention unincorporated villages and towns.

As previously stated, the work of the State Board of Health has been almost wholly educational up to the present time. True, state laws relating to public health matters have been passed, but these are more especially for the protection of individuals and communities against the few people who refuse to be benefited by educational measures. Through the agency of "Health Notes," weekly press bulletins and other literature, the majority of the people throughout the state have come to learn a great deal regarding disease prevention. However, I regret to say, many people do not put into practice the knowledge they possess. The fact that they do possess this knowledge is shown by their intelligent co-operation whenever, because of some infectious disease, a representative of the State Board of Health is sent to some city or smaller community. Procrastination, both on the part of individuals and city officials, has been responsible, no doubt, for many deaths from preventable disease.

In the presence of epidemics of various diseases most of the cities and towns in my district (and I believe in most cities and towns in Florida) have at some time or other attempted some form of health organization. In a few instances some attempt is made to keep the city in such condition that preventable diseases are in a large measure prevented; in others the health organization is only called into use in the presence of some epidemic; while in still others there is no health organization, not even a sanitary committee from the city council, and no health officer or city physician. In short, there is nobody in authority and no local health officer who can take charge of the situation in the presence of epidemic diseases until the arrival of a representative of the State Board of Health.

It seems almost incredible that with the advances this state has made in other fields, health conditions in the smaller cities and towns have been so much neglected, and I am afraid the burden of responsibility rests largely with the local physicians. It is only within the last few months that the majority of cities have passed the "Model Ordinance" for the reporting of births and deaths, a duty which it actually required a law to enforce upon physicians. With vital statistics as a basis, we shall be better able to keep track of the diseases from known preventable causes. As vital statistics become more and more accurately recorded (and the State-Wide Law will insure that) I feel sure that the number of deaths from preventable diseases will show the necessity for better, more uniform health organizations in all the cities and towns of Florida. The time has passed when all that is necessary is to isolate a case of typhoid fever in a screened room and disinfect the excreta. That is all very necessary, but we must go farther; we must prevent the breeding and liberation of flies; require dairies to supply us with clean milk, and have a good pure water supply.

We now have a creditable State Board of Health with full time physicians employed, our larger cities have very efficient health organizations and employ paid health officers. The next step in the scheme, to my mind, is a uniformity in health organizations in all the smaller municipalities of Florida, with health officers who are paid sufficiently so that they shall be fully recompensed for the time spent in local health work and for what practice they lose by reason of antagonizing violators of health ordinances. If some such scheme is put into operation in the various cities it will then be a comparatively easy matter to extend this health organization to the country districts and later to entire counties.

Before offering any suggestions I wish to call to your attention a few of the most glaring of the insanitary conditions by which we of the smaller cities are surrounded.

First: Insanitary Open Surface Privies.

Here flies breed in great numbers. They not only breed in the privy filth, but they feed upon it and crawl over it, and then these same flies come into our houses (and screens will not exclude them all) and alight upon our food or on the nipple of the baby's nursing bottle. Open privies, through the medium of flies, are a constant source of danger in the spreading of typhoid fever, summer diarrheas of children and through soil pollution, in the wholesale distribution of hookworm disease.

Second: Unprotected Manure Piles.

Here flies breed in countless numbers to do their part in the spread of typhoid fever, summer diarrheas of children, smallpox, diphtheria and possibly some of the other infectious diseases.

Third: No Adequate Means of Garbage Disposal.

Some cities now supply garbage wagons, but in most of the smaller towns no such system is in use—hence another fertile breeding place for flies, for even if individuals do bury their garbage in the back yards, the fly larvae already in course of development will grow to full-sized flies and crawl up through the soil.

Fourth: Ponds, Swamps, Rain Barrels, Cisterns, Cesspools, etc.

When these are not made mosquito proof—hence malaria—and we should not forget the dreadful epidemic of yellow fever in 1888. History sometimes repeats itself.

Fifth: Insanitary Dairies.

It is unnecessary for me to go into details, but conditions in practically all the dairies I have inspected in my district has been most unsatisfactory to say the least. Open privies adjacent to milking barns and bottling rooms are a common occurrence. These rooms either are not screened or else they keep as many flies inside the bottling room

as they exclude. Flies on the cows, on the pails and other utensils, on the milk, flies everywhere; and outside the dairy barn a huge mountain of manure fairly crawling with fly maggots. In view of all these dreadful conditions, is it any wonder we get dirty milk?

Taking 500,000 bacteria per cubic centimeter as a high limit, with a requirement that the milk contain no colon bacilli, how do the following milk counts appeal to you? The specimens were taken by me on the dates mentioned. The bacteriological work was done at the Jacksonville laboratory of the State Board of Health. All samples of milk were packed in ice for delivery to the laboratory.

Daytona—May 2, 1914 (dairies):

First—Approximately 1,300,000 bacteria per cc., no colon bacilli present.

Second—400,000 bacteria per c.c., colon bacilli present.

Third—6,205,000 bacteria per c.c., colon bacilli present.

Fourth—58,900,000 bacteria per c.c., colon bacilli present.

Fifth—Billions bacteria per c.c., colon bacilli present.

Sixth—Approximately 4,500,000 bacteria per c.c., no colon bacilli present.

Seventh—Approximately 1,130,000 bacteria per c.c., colon bacilli present.

Eighth—Billions bacteria per c.c., colon bacilli present.

DeLand—May 2, 1914:

First—75,000 bacteria per c.c., no colon bacilli present.

Second—600,000 bacteria per c.c., colon bacilli present.

Third—470,000 bacteria per c.c., colon bacilli present.

Fourth—Billions bacteria per c.c., colon bacilli present.

St. Augustine—March, 1915:

First—96,000 bacteria per c.c., colon bacilli present.

Second—87,000 bacteria per c.c., colon bacilli present.

Third—17,500,000 bacteria per c.c., colon bacilli present.

Fort Pierce—April, 1915:

First—900,000 bacteria per c.c., colon bacilli present.

Second—1,900,000 bacteria per c.c., colon bacilli present.

St. Augustine—May 8, 1915:

First—1,000,000 bacteria per c.c., colon bacilli present.

Second—50,000 bacteria per c.c., colon bacilli present.

Third—800,000 bacteria per c.c., no report on colon bacilli.

Fourth—1,500,000 bacteria per c.c., colon bacilli present.

Fifth—1,500,000 bacteria per c.c., colon bacilli present.

Sixth—8,800,000 bacteria per c.c., colon bacilli present.

Seventh—Did not get sample from this dairy. It is the one which in March, 1915, had a bacterial count of 17,500,000 bacteria per c.c., with B. coli present.

Gentlemen, the above milk counts speak for themselves; they are representative of the quality of milk we are getting in our smaller cities. Just how many babies these dairymen have killed cannot be determined since we have not had the benefit of vital statistics long enough to compile figures. However, a glance at the above milk scores will convince you that such milk is only fit for swine and yet we must use it and feed it to our babies because we have no better.

Sixth—Filthy Slaughter Pens:

I made the following report to Dr. Porter of an investigation made of a slaughter pen beyond the city limits of Jacksonville which will give you a general idea of conditions all over the state of Florida:

"Jacksonville, Fla., Sept. 8, 1913.

"Dr. J. Y. Porter, State Health Officer,
"Jacksonville, Fla.

"Dear Doctor: In regard to my inspection of the slaughter house belonging to Mr. W. L. Graddick, located on Highway

Avenue beyond the city limits in Duval county, I submit the following:

"On Wednesday afternoon, August 27th, I made an inspection of the above premises. The first things that attracted my attention were several pools of mud surrounding the building and the foul odor arising from same. The building itself is a rough board structure, the boards of which are an inch or more apart, thus permitting the free entrance of flies.

"The interior arrangements consist of two rooms, separated by a partition, and an outer shed. In the first room the animals are brought in, killed and dressed. Here the floors are uneven and dirty and the sides are covered with dirt, dried blood and grease. Higher up, about five feet from the floor, are hooks for hanging up hearts, livers, kidneys, etc., as they are taken out of the animals.

"The rafters of the building are full of spider webs and serve as an excellent place for the lodgment of dust.

"The next room contains a vat at one end where the hides are immersed in brine. The other end of this same room is very filthy, the floor being covered with mud and slime, the odor from which is much like that from a privy vault.

"The outer shed is not so bad as it is more exposed to the light and air, but even this could be improved greatly by a little cleaning up.

"The dressed meat and the various internal organs hanging on the hooks were covered with a considerable number of flies, some of which were blue ones and others of the common house variety. No screens are used at all.

"The meat is carried out and without being wrapped up is dumped into wagons for delivery to the city.

"Outside the building a number of pigs were wallowing in the mud; this mud, of which there is considerable, is formed partly by the drainage of blood and water from the slaughter house.

"While I was there one of the negro laborers urinated outside the pen and then went back to handling the meat without washing his hands. As there is no privy for the use of the men they have to go into the weeds beyond the building. They probably are not very careful afterwards about washing their hands before handling the meat. While I was talking to Mr. Graddick he spit on the floor of the room where they skin and dress the meat.

"Respectfully submitted,

(Signed) "M. E. Heck,

"Assistant to the State Health Officer."

Seventh—Public Schools:

No school inspections are carried out in the smaller cities. Many of these schools are housed in overcrowded, poorly ventilated buildings and have most miserable toilet accommodations.

Eighth—Surface wells are not so constructed so as to prevent contamination of the water.

Ninth—Bakeries, meat shops, grocery stores, soda fountains, etc., are kept in insanitary condition.

Besides all these, other conditions arise from time to time which require strict attention. Sanitary nuisances must be suppressed so, of course, it is essential that a local health organization be established with a competent physician as a paid Health Officer with authority to act.

The following difficulties present themselves:

First—Indifference on the part of physicians. Physicians will treat case after case of preventable diseases without suggesting improvement in sanitary surroundings.

Second—Indifference on the part of city officials.

Third—The claim of lack of funds to pay a local health officer.

Fourth—Antagonism to the health officer through petty jealousies of other physicians.

Fifth—Inadequate ordinances.

Sixth—Lack of knowledge of conditions of:

(a) Milk supply.
(b) Slaughter houses.
(c) Privies and stables as breeding places of flies.

By way of remedy for the present state of affairs, in case the crude shoe I have made fits the particular town you represent, I would suggest the following:

First—A good ordinance creating a board of health (a sanitary committee of the council will do); creating the office of City Health Officer, defining his duties, and fixing his salary. The same ordinance should provide also for a sanitary inspector.

Second—This ordinance should include, as various sections, a regular health code for the city. For instance, one section could relate to the regulation of dairies, another to that of slaughter houses and another to privies, stables, etc.

Third—Make it the duty of the city health officers to make monthly reports both to the city council and to the State Board of Health. In this way there will be established a co-operative system between the various cities and the State Board of Health.

Fourth—Have this ordinance or system of ordinances published in pamphlet form, so that copies may be sent to violators with the violated section marked.

Fifth—Have a complete sanitary survey made of your city immediately following the appointment of a City Health Officer.

The above are only a few suggestions. Local conditions will have to govern the details, and when new points present themselves, changes can be made to suit each individual case. Gentlemen, I have addressed my paper to you as representatives of many of the cities of Florida, not so much for the purpose of making suggestions to you as for the purpose of having you pause to think of some of the things I have mentioned. You as representatives of the medical profession are largely responsible for the lives of the people in the towns where you live. In case of epidemics it is to you they look for protection and deliverance and it is up to you to recognize insanitary conditions and suggest the remedy. If there is indifference in your communities, keep talking until the people are educated up to the point where they will demand the very best in the way of public health administration.

Let the people rule—you teach them how.

SOME THOUGHTS ON SCHOOL INSPECTION.

D. C. Main, M. D.,
Welaka, Fla.

Civilization is as yet but a mere film of refinement and intelligence lightly placed upon a foundation of ignorance and superstition.

Every physician must at the present time be a missionary and expect to meet with criticism.

People look to us for restoration to, and preservation of, health, and modern medicine looks to the prevention of disease.

In the present age it is not so much what a physician is able to cure as what he is able to prevent that marks him as a benefactor.

While we are practicing medicine for a living, the work we do every day in the office and at the bedside cannot be brought to a commercial basis.

In our work as school physicians we aim to do two things—stamp out contagious diseases by finding them early and taking steps to prevent their spread, and to correct any existing condition that may be holding a child back either physically or mentally.

I want you to realize that you hold the most responsible position within the gift of man—conservators of the child's health and thus of the health of future generations.

Don't be the one to say, "I don't have

time to do the work, get someone else," but if school work is offered you at any time, do it even though the cash remuneration be small.

We go over our school children to detect eye, ear, nose and throat diseases, skin diseases, and the onset of contagious diseases in order not only to prevent further infection but also to lessen the many serious sequelae.

Let us add tuberculosis. Over 100,000 die annually from tuberculosis in the United States. To eradicate it it is necessary that the public be educated to assist in checking the spread of the germ.

The importance of attacking this problem through the agency of the public schools is indicated by the fact that ten out of every eleven of the children of this country come under the jurisdiction of the public school system for approximately seven out of the first fourteen years of their lives.

In addition to school inspection, we should instruct our teachers in the detection of the early evidences of the onset of the diseases we are looking for, and the older children should receive instruction with reference to the fundamental facts regarding tuberculosis and the more serious of the other diseases.

A close study of the etiology of the nervous diseases of childhood would enable us to prevent many cases of that protean condition, Epilepsy.

At the present time our state makes no provision for exceptional children, but it is to be hoped that the report of the recently appointed commission to look into the state's need for an institution for the feebleminded and epileptic will be strong enough to impress the lawmakers with the fact that such an institution is needed, and this will lighten the work of the school teacher to some extent, as it will remove from her classes many who are a drag on the more intelligent pupils, though not many of these two classes attend school for more than a short period of time.

Draw up a form of blank on stiff cardboard that will give you room in allotted spaces for the name of school, date, name of pupil, age, etc., mental status, condition of eyes, ears, nose, throat, skin, lungs and general physical appearance.

MEDICAL INSPECTION.

.....School.

Pupil's name.....
Age..... Date of Examination.....
Sight. S. R.....L.....
I. No. 1. R.....L.....
Headaches .....
Parent's Sight:
Father .....
Mother .....
Hearing.
Watch, R.....L.....
Voice, R.....L.....
Catarrhal Diseases.
Skin Diseases.
Contagious Fevers.
Vaccination.
Mentality.

Doctor.....
Medical Inspector.

Get your county superintendent to have them printed and when you go to a school get some intelligent boy or girl to assist you in the writing and you will not find it very much of a task to gather statistics that will be of value to the school, but you will also get training that will be invaluable to yourself.

The writer knows this to be a fact, for he had at one time the initial appointment as school physician to several hundred pupils and the inspection was done monthly by order of the city Board of Education.

The blank submitted for your approval was the result of this experience and was adopted by the thirty other inspectors in the same county and by a neighboring city of some thirty thousand.

It is not claimed to be perfect, but can be changed to suit individual ideas as experience shows them to the individual.

The Journal of the Florida Medical Association

Owned and published by the Florida Medical Association.

Published monthly at St. Augustine and Jacksonville. Price, $1.00 per year; 15 cents per single number.

Address Journal of the Florida Medical Association, St. Augustine, Florida, or 334 St. James Building, Jacksonville, Fla., U. S. A.

EDITOR.

GRAHAM E. HENSON, M. D.....*Jacksonville, Fla.*

ASSOCIATE EDITORS.

R. H. MCGINNIS, M. D.....*Jacksonville, Fla.*
A. H. FREEMAN, M. D.....*Starke, Fla.*
J. K. SIMPSON, M. D.....*Jacksonville, Fla.*

COLLABORATORS.

RAYMOND C. TURCK, M. D., F. A. C. S., Jacksonville *Surgery*
THOMAS TRUELSEN, M. D., Tampa.....*Medicine*
GERRY R. HOLDEN, M. D., F. A. C. S., Jacksonville *Gynecology*
JAMES D. LOVE, M. D., Jacksonville.....*Pediatrics*
W. S. MANNING, M. D., F. A. C. S., Jacksonville.... *Eye, Ear, Nose and Throat*
J. L. KIRBY-SMITH, M. D., Jacksonville...*Dermatology*
HENRY HANSON, M. D., Jacksonville..... *Bacteriology and Pathology*

OFFICERS OF THE FLORIDA MEDICAL ASSOCIATION.

R. H. MCGINNIS, M. D.
President .....*Jacksonville, Fla.*
JOHN A. SIMMONS, M. D.,
First Vice-President .....*Arcadia, Fla.*
MARY FREEMAN, M. D.,
Second Vice-President.....*Perrine, Fla.*
J. H. COFFEE M. D.,
Third Vice-President .....*Ft. Meade, Fla.*
GRAHAM E. HENSON, M. D.,
Secretary-Treasurer .....*Jacksonville*
JAMES D. PASCO, M. D.,
Librarian .....*Jacksonville*

ADVISORY COMMITTEE.

J. D. LOVE, M. D.....*Jacksonville*
G. R. HOLDEN, M. D., F. A. C. S.....*Jacksonville*
J. V. FREEMAN, M. D.....*Jacksonville*

COUNCILLORS.

First District — Escambia, Santa Rosa and Walton Counties: J. Harris Pierpont, M. D., Pensacola..1916
Second District—Franklin, Gadsden, Jefferson, Leon, Liberty and Waukulla Counties: Henry E. Palmer, M. D., Tallahassee 1917
Third District—Columbia, Hamilton, Madison, Lafayette, Suwanee and Taylor Counties: C. S. Brown, M. D., Live Oak 1917
Fourth District—Duval, Clay, Nassau and St. Johns Counties: Gerry R. Holden, M. D., Jacksonville..1918
Fifth District—Citrus, Hernando, Lake, Marion and Sumter Counties: E. Van Hood, M. D., Ocala..1919
Sixth District—Hillsborough, Pasco and Pinellas Counties: Thomas Truelsen, M. D., Tampa.....1919
Seventh District—Brevard, Orange, Osceola, St. Lucie and Volusia Counties: David Forster, M. D., Hawks Park P. O., New Smyrna.....1918
Eighth District—Alachua, Baker, Bradford, Levy and Putnam Counties: J. H. Hodges, M. D., Gainesville 1916
Ninth District—Calhoun, Holmes, Jackson and Washington Counties: J. S. McGeachy, M. D., Chipley, 1918
Tenth District—DeSoto, Lee, Manatee and Polk Counties: Y. E. Wright, M. D., Wauchula.....1916
Eleventh District—Dade, Monroe and Palm Beach Counties: W. R. Warren, M. D., Key West.....1917

Next Meeting — Arcadia — May 10-12, 1916

ONE MORE HONEST ADVERTISER.

It is with considerable pleasure that we note *The Journal of the Medical Society of New Jersey* has joined the ranks of honest advertising. With the September issue of their publication they eliminate all objectionable advertising matter and in the future will require that all advertising patrons comply with the standard set by the Council on Pharmacy and Chemistry of the American Medical Association. By so doing all honest advertisers are given a protection which they have a right to demand. One by one the medical journals of the country are being brought into the folds of honest advertising, thereby not only protecting their advertising patrons but also their readers. A powerful factor in this campaign in so far as the state medical journals are concerned, is the Co-operative Medical Advertising Bureau of Chicago, a bureau working under the auspices of the American Medical Association. This bureau is a valuable aid in securing advertising patronage for the state journals, in fact it was organized for the sole purpose of assisting the state medical publications. It is not a commercial advertising agency for profit, their sole requirement, which must be and is strictly lived up to, being that all publications receiving their assistance conform to the standard required by the Council on Pharmacy and Chemistry of the American Medical Association in accepting advertising copy from medical houses.

We congratulate the staff of *The Journal of the Medical Society of New Jersey* on the step they have taken and extend to the Medical Society of New Jersey our wishes for continued prosperity for both their association and their very excellent official organ.

DEFENDING THE GREAT AMERICAN FRAUD.

"Most of the fellows and members of the American Medical Association are aware of

the fact that the Chattanooga Medicine Company and its chief owner, John A. Patten, manufacturers of Wine of Cardui, have sued (1) the American Medical Association and the editor of THE JOURNAL for $300,000, (2) Dr. Oscar Dowling, president of the Louisiana State Board of Health, for $25,000 and (3) *Harper's Weekly* for $200,000. Comparatively few realize, however, that the 'patent medicine' interests of the country are spending money lavishly in a desperate effort to win a suit on whose outcome, they consider, depends the very life of the nostrum business. We have, at different times, given our readers an insight into some of the methods pursued in this case, especially in connection with the employment of detectives for the apparent purpose of manufacturing 'evidence.' *The Journal of the American Medical Association* calls attention to an interesting article in the current (October 2) issue of *Harper's Weekly*, wherein are described the activities of some of the horde of detectives employed in this case. We suggest that physicians who have the interest of the public health and the medical profession at heart buy a copy of this week's *Harper's*. Under the title, 'Patten in Pink Whiskers,' the story gives in detail the experience of 'Operative No. 48,' a detective who threw up his job in disgust at the work he was expected to do for the 'patent medicine' interests. How the private papers of the secretary of the Limestone County Medical Society were ransacked; how the minutes of that society were purloined and copied; how the Chattanooga pastor was dogged by detectives and private conversations taken down in shorthand by stenographers hidden from view—these are some of the things described by 'Operative No. 48' in the *Harper* article. Read in connection with *The Journal's* articles on the Wine of Cardui case, it gives a very good idea of the methods to which the 'patent medicine' interests will descend in their attempt to discredit the medical profession and to protect their noisome brood.

Those who in the past have built up huge fortunes by swindling the sick, sense the downfall of their business that is bound to follow the publicity that has been given it by the American Medical Association and other agencies. Really the Wine of Cardui cases are not simply 'Chattanooga Medicine Company *vs.* The American Medical Association, Oscar Dowling and *Harper's Weekly;*' they are 'The Great American Fraud *vs.* The Medical Profession and the Public.'"

IS STRYCHNIN A "CARDIAC TONIC"?

"Clinical evidence sometimes endows drugs with diverse and unexpected properties. In some degree this seems to have been the case with strychnin. Many physicians administer this drug in cardiac emergency, although the pharmacologists have not been able to demonstrate that it increases the output of the heart. Doubtless for this reason there is a considerable degree of reserve in the textbooks of pharmacology in condemning any presumably useless practice that has been widespread. Thus, some books state that no essential increase in blood pressure follows the experimental administration of nontoxic doses of strychnin, but admit that, in pathologic conditions attended with abnormally low pressures, beneficial results may possibly follow. The alleged value of strychnin in surgical 'shock' has no experimental basis to support it and is, indeed, denied by many competent observers. It is a fact readily demonstrated on animals that cardiac muscle is not only not stimulated, but also decidedly depressed both in amplitude and in rhythm under the influence of strychnin. Greene sums up the situation," says *The Journal of the American Medical Association*, "when he says that the beneficial effects of strychnin on the circulatory system

which have been claimed in therapeutic practice must rest wholly on the changes in the reaction delicacy through the central nervous mechanisms. By an increase in the irritability of the cardiac inhibitory and acceleratory centers, normal stimuli may produce more profound and beneficial changes in the musculature of the cardiac apparatus. It must be remembered, however, that even this favorable response to strychnin is somewhat antagonized by the depression of the cardiac muscle tissues.

"Inasmuch as the laboratory studies of the action of strychnin show that doses permissible in one man can scarcely be of direct use in the treatment of heart disease, the use of the drug as a 'cardiac tonic' must be defended, if at all, on the basis of some indirect effect. In the series of articles on practical pharmacology in *The Journal of the American Medical Association,* it has been attempted in a mild way to make allowance for the undemonstrated, reputed usefulness of the drug by stating that strychnin may slow the heart through vagus stimulation at times; it may improve the circulation through its actions on the vasomotor and respiratory centers—for one cannot wholly separate the influence of the respiration and circulation—and thus through the circulatory changes it may improve the nutrition of the heart. In a similar way it causes improvement in the voluntary muscles and other tissues of the body when it improves the circulation by increasing muscular activity.

"In a review of the facts gathered by clinical observers on this subject, Newburgh quotes evidence which shows that, even though a single dose of strychnin does not benefit persons suffering from heart failure, it is not proved that the prolonged use of the drug may not be a material aid in the relief of broken cardiac compensation. At the Massachusetts General Hospital in Boston he investigated the possible effect of the administration of large doses of strychnin over a period of several days in persons suffering from chronic heart failure. None of the patients were benefited by strychnin. The compensation was not improved in the slightest by the drug, but some of the patients subsequently recovered their compensation as the result of digitalis administration. The failure of strychnin to have its reputed effect, therefore, cannot be explained by assuming that the patients under observation were beyond all therapeutic aid. Those who improved under digitalis failed to do so during the strychnin period solely because strychnin does not improve the heart. Newburgh concludes that neither pharmacologic nor clinical evidence justifies the use of strychnin in the treatment of acute or chronic heart failure."

MEDICAL LICENSURE.

"The responsibility for the licensing of medical practitioners has been left by the national government to the individual states; it is left to the state to establish the only legal barrier possible between the public and the thousands who seek authority to treat human diseases. Some states have provided an efficient guaranty that practitioners given the state's endorsement have secured the essential educational qualifications. In some states, however, the responsibility has been taken up in such a happy-go-lucky manner, and the legislation provided is so contrary to effective legal procedure, that the situation would be laughable were it not for the serious menace to the public. In some states, laws have been passed, admirable in their composition and excellent in their purpose, only to be invalidated by clauses or by other laws exempting the very persons to whom the law should apply. Invariably, the exemptions are those unable to comply with the educational requirements of the practice act and against whom the people most need protection—those who have had little or no medi-

cal training. The making of such exemptions, either by special clauses in the practice act or by laws providing special boards and lower educational standards," says *The Journal of the American Medical Association,* "is clearly perverting medical licensure, so that instead of protecting the public against the incompetent, it is providing special privileges for the incompetent, untrained men and women parading as the apostles of some 'new and marvelous' form of healing. Legislators have yet to learn that the art of healing is not gained by birth or by inspiration, but by a rigid and prolonged course of training in the fundamentals of medicine. The only way to make medical licensure a real protection of the public is to provide one licensing board in each state with ample power to apply one educational standard alike to all practitioners of the healing art."

Cancer Department

"In the early treatment of cancer lies the hope of cure."

AMERICAN SOCIETY FOR THE CONTROL OF CANCER

Consult the best authorities concerning the beginning of cancer.

Attach great importance to the potential dangers of chronic irritation.

Never wait to see what will happen to a lump in the breast.

Chronic indigestion is not a diagnosis, but a symptom-complex which requires the elimination of gastric cancer as its cause.

Early recognition is the key-note to the control of cancer.

Radical removal is the safest treatment for a doubtful growth.

Reviews from Current Literature

KELOID IN SCARS

Freeman, Leonard: The Preventive of Keloid in Scars. Annals of Surgery, 1915, Vol. LXI, p. 605.

The writer states: "The free transplantation of fascia lata has been employed recently for a variety of purposes—in operations for hernia; to close defects in the abdominal wall, the pleura, the bladder, the intestinal tract, the trachea and the larynx; in nephro and gastropexy; for elevation of the corner of the mouth in facial paralysis and of the eyelid in ptosis; for the reinforcement of suture-lines in operations upon the intestines; for closure of the pylorus in gastro-enterestomy; for the repair of tendons and the formation of new ones; in the mobilization of anchylosed joints, etc.

It is well adapted for all these purposes because of its strength and non-elasticity; its remarkable tendency to heal in, even, at times, in the presence of infection; and because it does not undergo absorption, but remains unchanged within the tissues. The material is abundant and easily obtained. It may be removed from the thigh in narrow strips or in large areas, with or without closure of the resulting gap in the fascia, there being little danger of subsequent injury to the functions of the extremity."

Freeman has utilized fascia lata to prevent the return of keloid in scars, and to prevent cicatricial hypertrophy. The scar is dissected out, the skin edges are under-united, and a strip of fascia is smoothly implanted in the bottom of the incision. The edges of the facial strip are sutured to the under surface of the skin. The skin is closed.

The writer states that the method is probably not applicable to true keloid, but that unsightly, contracted, or hypertrophied scars may be relieved by the intelligent use of fascial grafts. R. C. T.

OPEN TREATMENT IN INFECTED WOUNDS

Dyas, Frederick G.: The Open Treatment of Infected Wounds. J. A. M. A., 1915, Vol. LXIV, p. 1829.

Arguing that heat and moisture are essential to the growth and propagation of practically all pathogenic bacteria, Dyas recommends that infected wounds be exposed to the air, to aid in dehydrating the infected area, desiccate the sloughing tissues and secretions, and thus minimize germ growth and toxic absorption. He quotes the splendid results obtained in the open air treatment of burns, and applies these teachings to the treatment of infected wounds in general.

His conclusions follow:

"1. The advances made in the treatment of old suppurative wounds has not been in keeping with the advances made in other departments of surgery.

"2. The treatment of suppurating areas by voluminous dressings, either sterile or antiseptic, macerates and devitalizes the tissues, fosters the development of the pathogenic flora and does not assist in the repair of the tissue.

"3. It is always of advantage, when possible, to convert a moist into a dry type of gangrene. Therefore, the desiccating influence on the wound of the atmospheric air, in the absence of moist coverings of any sort, tends to attenuate infecting organisms.

"4. The method is safe, economical and is in keeping with nature's own processes as observed in the lower animals.

"5. The patient's period of convalescence is shortened and he absolutely suffers no pain.

"6. In my experience, both in the treatment of wounds and of burns, the danger of contamination from the atmospheric air is negligible.

"7. The addition of plenty of sunshine would be a valuable asset, but is not readily obtainable." R. C. T.

PROSTATIC OBSTRUCTION

Tenney, Benjamin: Prostatic Obstruction Without Hypertrophy. Surg., Gyn. and Obs., 1915, Vol. XXI, p. 206.

Tenney cites sixty-four cases of prostatic malformation, either congenital or acquired, which produced urinary obstruction.

He states that "Prostatic obstruction without enlargement may be due to—

"1. Dense layer of new-formed connective tissue below the mucous membrane and infiltrating the internal sphincter—the fibrous ring.

"2. The same process with chronic inflammation of the submucous gland tissue—the bar.

"3. Hypertrophy of submucous gland tissue involving the suburethral or subtrigonal groups or both—the hypertrophy in miniature.

"4. Connective tissue replacing the glandular below the internal sphincter muscle—the fibrous prostate.

"5. Congenital malformation."

Of the sixty-four cases mentioned, thirteen were operated by the perineal route and forty-six through the bladder. There were unsatisfactory results in eleven, satisfactory results in forty-seven, and four deaths. Some of the operations were very difficult because of the very hard fibrous prostates. The writer recommends the use of Young's punch, the Chetwood cautery or cauterization through the bladder rather than prostatectomy in these cases. R. C. T.

VITAL STATISTICS

Harris, Wm. J.: The Importance of Vital Statistics Legislation in the South. Southern Med. Jour., Vol. VIII, p. 833.

The only way we can remove the slander against the South of being unhealthy and having a high death rate is by accurate registration of deaths. I am fully convinced that this will prove that the South is as healthful as any part of the United States.

Life insurance companies of the North for many years charged a higher rate to policy-holders in the South, which cost the people of the South millions of dollars. This would have been saved by accurate vital statistics.

I am of the opinion that the death rate among the whites in the South, except in a few localities, is as low as in the North.

In the South most of the servants are negroes, who live in settlements, and it is important that their white employers know to what causes their deaths are due.

The South desires immigrants of the proper character from every section of the United States to aid in its industries and in its fields. The Bureau of Census is constantly receiving letters inquiring as to the sanitary conditions and rates of mortality in various parts of the South. We are obliged to advise them that, with the exception of a few cities, no death rates are available for the South.

The South is to be congratulated on the rapid strides made in recent years in the enactment of effective state laws for the registration of births and deaths.

Realizing the importance to the entire country of accurate vital statistics in the South, I have detailed employes of the Census Bureau to help these states inaugurate and perfect their systems, so as to advance the time when all the states will be admitted to the registration area. I will be glad to aid any state in every way possible in this important work.

Florida's State Board of Health in 1904 promulgated rules closely following the model law, which had the effect of law, but the rules are not enforced and no results have been obtained.

During the last year, however, the State Health Officer has been very active in having municipalities with a population of 2,000 or over in 1910, adopt a strict ordinance (drafted by the Bureau of Census), containing all the essential features of the model law, and it is his intention as soon as conditions warrant to have the model law enacted so that it will cover the entire state.

One of the most important uses of vital statistics is their practical employment for the promotion of public health and for the prevention and restriction of disease. Modern preventive medicine is based on vital statistics, and a sanitary service, whether state or municipal, which is deprived of accurate vital statistics is absolutely handicapped in its work.

Under my instruction a monograph on at least one important cause of death will be prepared each year, the publication of which will precede the regular annual mortality report. The first of these monographs will relate to cancer and will be published during 1915. The deaths from this cause will be so subdivided that statistics will be presented for thirty forms of cancer.

A monograph on tuberculosis will follow that on cancer. T. T.

CHRONIC RENAL INFECTION

Curtis, Arthur H.: Laboratory Diagnosis of Chronic Infections of the Urinary Tract in Women. Surg., Gyn., and Obst., Vol. XXI, 1915, p. 423.

Chronic infections of the urinary tract can best be diagnosed, says the author, by one who is actively engaged both in clinical work, including cystoscopy, and in laboratory study. Careful correlation of clinical findings and laboratory methods, with extensive modifications in cultural technique to meet individual cases, is essential.

The source of even small amounts of pus in the urine should be investigated; the place of its formation can be definitely localized through ureteral catheterization.

Persistent pyuria in the absence of a gross bladder lesion is almost invariably due to kidney disease.

In those frequent cases with bladder irritability which yield clear, bacteria-free urine, cultures from the traumatized urethral canals, or from introduction of a probe into Skene's ducts, may demonstrate the cause of infection. When bacteria are widely scattered or grow with difficulty, a mixture of the urinary sediments with blood, followed by the making of a large number of ascites-bloodagar tubes of high dilution, results in conditions favorable for the development and isolation of the bacteria present.

Experience teaches that the chief lesions in urinary tuberculosis are usually renal. In obscure cases, laboratory diagnosis is facilitated by potassium iodide, tuberculin, kidney massage, limitation of liquids, repeated examinations of fresh specimens after high-power centrifugation, Petroff's cultures, and injection of a series of medium-sized guinea pigs.

There is seemingly a tendency to lay undue stress on functional urinary tests at the expense of careful routine examination.

G. R. H.

TRACHOMA

Webster, Fox L.: Trachoma and Its Treatment. Ophthalmology, Vol. XI, 1915, p. 667.

Trachoma, or granular conjunctivitis, as known in this country, is a contagious specific disease of the palpebral conjunctiva, characterized by increased thickening and vascularity, and by the formation of granular elevations of lymphoid infiltration, which undergo ulceration and subsequent cicatrization. The recent studies of Halberstadter and Prowaczek seem, however, to have led to the discovery of so-called "trachoma bodies," which are believed to occupy a position, morphologically, between bacteria and protozoa.

The disease is most frequently found in the inhabitants of barracks, asylums, almshouses and other places in which people are prone to be careless in the use of towels, handkerchiefs and similar personal articles. As already stated, it is particularly common among immigrants, especially the Armenians, Syrians and Russian Jews, but the American negro seems to be comparatively immune to the affection, while the American Indian is extremely susceptible to it.

In the early stages of the affection, if the lids be everted, the surface will be found covered with small granular bodies, which

look very much like sago grains. These are either scattered or massed together (follicular trachoma), and constitute the chief feature of the clinical picture. In the latter stages, this tissue is partly absorbed, and partly converted into a dense, tendinous scar-tissue, which, by its shrinking, frequently causes deformities of the lid.

Various medicaments of an astringent nature character have long been employed in the treatment of this condition, such as nitrate of silver, copper sulphate, trichloracetic acid and orthochlorphenol (5 per cent solution). Dr. C. Montague Harston advocates solid carbon dioxid snow. In the milder forms of the disease happy results have been achieved by their continued application for a long period.

The author strongly advises the following grattage operation:

"The upper eyelid is grasped along its margin by means of Darier's forceps and, the edge being turned upon itself, the lid is everted until the retrotarsal fold is brought into view. A horn spatula should be inserted beneath the lid, to protect the cornea. The exposed conjunctiva is first thoroughly scarified with the three-bladed scapel. The granular tissue is then scrubbed with a toothbrush that has been steeped in a corrosive-sublimate solution (1:1000) just before being used. Immediately after scrubbing, the part is washed with a solution of the same strength. Another portion of the lid is then unrolled and the scarifying, scrubbing and washing are repeated. This process is continued until the whole palpeoral conjunctiva has been subjected to the treatment. If the lower lid is involved in the trachomatous process, it should be treated the same way.

W. S. M.

NEW AND NONOFFICIAL REMEDIES.

Since publication of New and Nonofficial Remedies, 1915, and in addition to those previously reported, the following articles have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association for inclusion with "New and Nonofficial Remedies":

PANTOPON (PANTOPIUM HYDROCHLORICUM).—A mixture of the hydrochlorides of the alkaloids of opium, containing 50 per cent of anhydrous morphine hydrochloride. It produces essentially the effects of opium, but, being devoid of opium extractives, may be used for hypodermic administration. It is probably absorbed more promptly and is free from the nauseant odor and taste of ordinary opium preparations. Pantopon (pantopium hydrochloricum) is also supplied as Pantopon (pantopium hydrochloricum) tablets 0.01 gm., Pantopon (pantopium hydrochloricum) hypodermic tablets 0.02 gm., and Pantopon (pantopium hydrochloricum) ampules 0.02 gm. The Hoffman-LaRoche Chemical Works, New York City. (*Jour. A. M. A.*, Sept. 4, 1915, p. 877.)

LAROSAN, ROCHE.—Calcium caseinate, containing calcium equivalent to 2.5 per cent calcium oxide. In the treatment of diarrheas of infants a useful food is that made from the curd of milk and diluted buttermilk. The preparations of such a mixture of proper composition being difficult to prepare in a private home, Larosan, Roche, is offered as a substitute. The Hoffmann-LaRoche Chemical Works, New York City. (*Jour. A. M. A.*, Sept. 4, 1915, p. 877.)

BETANAPHTHOL BENZOATE-MERCK.—A non-proprietary preparation of betanaphthol benzoate (see New and Nonofficial Remedies, 1915, p. 210). Merck and Co., New York. (*Jour. A. M. A.*, Sept. 4, 1915, p. 877.)

DIPHTHERIA ANTITOXIN, GLOBULIN.—Marketed in syringes containing 2,000, 3,000, 4,000, 5,000 and 10,000 units each. Cutter Laboratory, Berkeley, Cal.

ANTI-PNEUMOCOCCIC SERUM.—Marketed in syringes containing 10 c.c. Cutter Laboratory, Berkeley, Cal.

Publisher's Notes

CONCENTRATED ANTIDIPHTHERIC SERUM.

Recognizing the inconvenience and other objectionable features attending the subcutaneous administration of bulky doses of diphtheria antitoxin, some of the leading manufacturers years ago sought to isolate the antitoxin from the serum, in an endeavor to obtain a product that would represent as great a number of antitoxic units as possible in small compass. Experiments disclosed the fact that the antitoxic element in the serum is a globulin, or has such properties that it precipitates with the globulins. Various methods, all of them based upon the principle of repeated precipitation, have been employed to eliminate the non-essential portions of the serum, leaving only the globulins or antitoxin. The method employed in the laboratories of Parke, Davis & Company results in a globulin that is free from many of the albuminous substances that cause the undesirable by-effects which sometimes attend the administration of antitoxin. These proteins, which are removed in the process of concentration, are largely responsible for the toxic symptoms which serums may produce in susceptible patients. With the concentrated serum (globulin) it is found that rashes and other undesirable symptoms occur less frequently than with untreated serum, and when they do appear they are of a milder type.

In the production of Parke, Davis & Company's diphtheria antitoxin, care is exercised that the horses selected for the purpose shall be absolutely free from disease. In pursuance of this purpose the animals are kept for several days under close observation in a detention stable. During this time thorough physical examinations are made by competent veterinary surgeons. Not only must the animals be healthy and vigorous when inoculated—they must be kept so; and they are fed, stalled, groomed and exercised with this end always in view.

FORD CAR OWNERS.

Betz Tire Savers and Flexible Riders save more than their price on one set of tires and make your car as easy riding as a Pearce-Arrow or a Packard. Write today. Address Betz Tire Saver, Hammond, Indiana.

Our Advertisers Are Helping Us
Are You Helping Them?